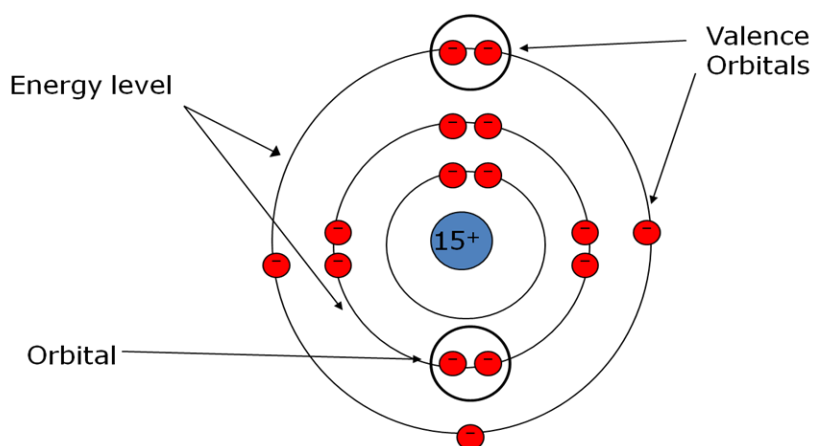


Outcome 1 - Bonding Basics and Ionic Compounds

Topic 1: Bonding Vocabulary and Lewis Diagrams (structures)

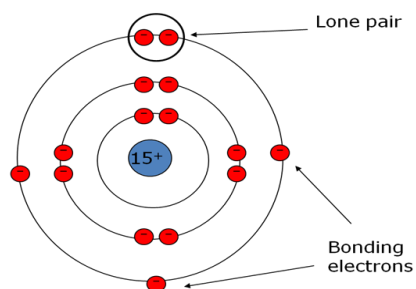
- **Energy level** - level of energy around an atom where electrons are found
 - The period # gives the # of energy levels of an atom
 - 1st level holds 2 e⁻, 2nd and 3rd holds 8e⁻
- **Orbital** - region of space around an atom's nucleus where an electron may exist
- **Valence Orbital** - orbitals found in the outer most energy level of an atom
 - Electrons in the valence orbital are called **valence electrons**.



- **Bonding electron** - single electron in an orbital.

-Bonding electrons are involved in bonding.

- **Lone pair** - two electrons in an orbital.



- **Electronegativity** - ability of an atom to attract electrons
 - Atoms have different abilities to attract valence e^-
 - Farther away that e^- are from the nucleus, the weaker they are held by the atom
 - Values are assigned from 0 to 4
 - Highest electronegativity is Fluorine at 4.0
 - Lowest electronegativity is Francium at 0.7

- **Octet Rule** - a max of 8 e^- can occupy the valence energy level of an atom
 - All atoms want to achieve a full valence energy level
 - Atoms bond to achieve a full valence energy level
 - When metals react they lose electrons to make this happen
 - Non-metals react and gain electrons to make this happen

- **Lewis Diagrams** - symbol showing the valence electrons of an atom
 - Write element symbol to represent nucleus *and filled energy levels*
 - Add a dot to represent each valence electron
 - Start by placing valence electrons into each of four valence orbitals
 - Once each orbital is half-filled start putting second electrons in each orbital

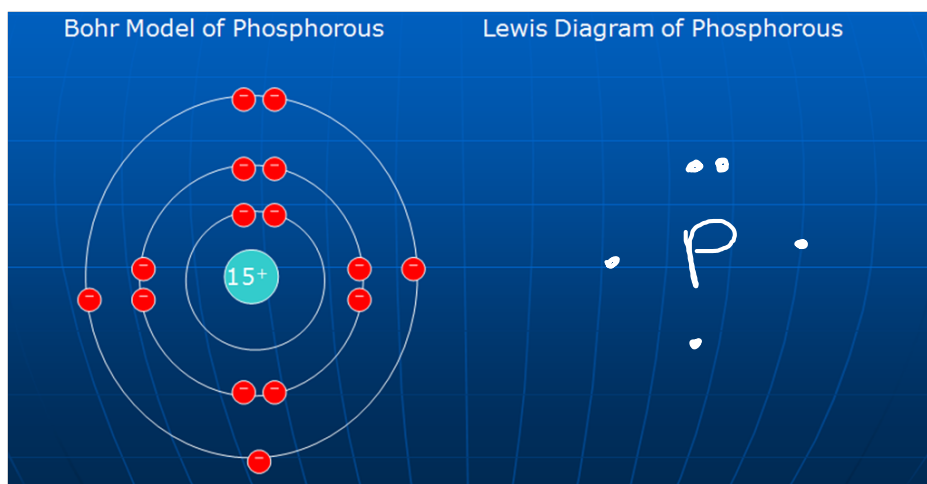


Diagram structure

2. Write the Lewis formula, the electron energy-level diagram, and the electronegativity value for each of the following atoms:

(a) aluminium

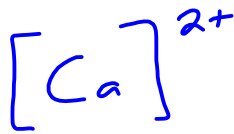
(b) calcium

(c) chlorine

(d) argon



3. (a) Draw the Lewis symbol for a calcium atom, but omit the two dots for valence electrons. Show that the remaining structure has a double positive charge by enclosing the Lewis structure in large square brackets and writing the overall charge to the upper right side, outside the brackets.



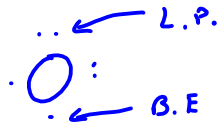
(b) What structure is represented by your symbol? What is it called?

ion

4. In a Lewis symbol of a potassium atom, describe what entities are assumed to be included in its element symbol.



5. Draw a Lewis Diagram for oxygen and label the following: lone pair, bonding electron.



6. List 3 ways that Lewis diagrams for metal atoms differ from Lewis diagrams for non-metal atoms.

